

On the Occurrence of *Morrhua macrocephala** at the Mouth of the Thames. By FRANCIS DAY, F.L.S.

[Read April 17, 1879.]

(PLATE XIV.)

IN the month of January this year I obtained, through the kindness of Mr. Carrington, Naturalist to the Royal Westminster Aquarium, an example of a large-headed Cod-fish, which had been captured at Southend, at the mouth of the Thames, but had died during its transit between there and London. A second example, stated to have been exactly similar, was taken along with the one alluded to, but unfortunately was not preserved. I believe this to be a species distinct from the Common Cod, *Morrhua vulgaris*, perhaps identical with Yarrell's "Lord-fish," likewise captured at the mouth of the Thames, while it certainly agrees with the description and figure of *Gadus macrocephalus*, Tiles. (Mém. Acad. Sc. St. Pétersb. ii. 1810, p. 350, t. xvi.), in most particulars, a species Swainson ('Fishes,' ii. p. 300, 1839) termed *Cephus macrocephalus*.

Yarrell (1836) gave a woodcut of the example which he obtained but omitted to preserve; and a comparison of his drawing with the figure appended to this paper will show that the proportions of the two specimens were very similar. Yarrell, however, mentions that by the fishermen it was considered to be only an accidental deformity, some injury to the spine having prevented the usual growth. There is reason to believe that the Speckled Cod of Dr. Turton, represented in his 'British Fauna' as frequently taken in the weirs at Swansea, is only the young of the Common Cod. The fishermen, according to Yarrell, however, appear to have been divided in opinion, as some said it was a fish which they met with occasionally, and believed it distinct from any other.

Dr. Cobbold (Proc. Royal Physical Soc. Edinb. 1854-58, i. p. 51), in a paper on the "Lord-fish" of Yarrell, stated that the example he possessed "consisted of a remarkable shortening of the body, arising from the coalescence of a great number of the vertebræ immediately succeeding the bones of the head. In the present example 21 were united together, and the shortening thus produced had given to the animal a curiously grotesque appearance. The middle dorsal fin was shortened, and the lateral longitudinal line

* In the 'Zoological Record' for 1870, p. 95, this fish is erroneously referred to as *Gadus macrophthalmus*.

arched very suddenly over the pectoral fins. Length, about 20 inches; depth, 8 inches. It corresponded very closely with the figure and description of this variety given in the second edition of Yarrell's *British Fishes*, vol. ii. p. 229."

Dr. J. Alexander Smith (*Proc. Roy. Phys. Soc. Edinb.* vol. iii. p. 302, 1864-65) gave descriptions of some deformed, hump-backed cod which he referred to *Gadus (Morrhua) punctatus*, Turton, and the "Lord-fish" of Yarrell. He mentions that Mr. Bargh stated these fish were not uncommon at this particular season of the year, and that in a take of six or seven dozens of cod from the long lines baited with the lug-worm, and laid on the north side of the Firth of Forth, six or seven of this variety were taken.

Dr. Dyce (*Ann. & Mag. Nat. Hist.* 1860, v. p. 366), after expressing his doubts about Turton's *Gadus (Morrhua) punctatus*, continues:—"While Yarrell, besides transcribing the descriptions of these authors, . . . states that a fresh example was brought him, caught at the mouth of the Thames, which the fishermen called 'Lord-fish,' and considered to be an accidental deformity. Thus, though each has suspected its existence, there has been no attempt made at removing the doubt." He concludes that, having obtained numerous examples, he was in possession of facts sufficient to set these doubts at rest—that, in short, the "Lord-fish" is a Common Cod unnaturally shortened, due to spinal disease, suffering from a species of rickets.

Thus Dr. Dyce, after having demonstrated the fact that the cod-fish and some members of the cod family suffer from a disease which occasions a shortening of the length of the spinal column, came to the conclusion that such deformed examples were identical with Yarrell's "Lord-fish" and the *Gadus (Morrhua) punctatus*, Turton, stated to have a large head and the lateral line nearer the back than in the "common cod," curved as far as the middle of the second dorsal fin, growing broader and whiter towards its posterior end, and a considerably longer lower jaw: he does not allude to the upper jaw.

The formula of the fin-rays is as follows:—

Gadus punctatus, Turton. D. 14 | 20 | 18. A. 19 | 16.

Lord-fish, Yarrell. D. 14 | 19 | 18. A. 17 | 11.

Gadus macrocephalus (Tiles.), Kner & Steind. D. 14 | 17 | 18-19. A. 20-21 | 22 ?

Present example. D. 11 | 14 | 16. A. 16 | 11.

If we examine Yarrell's figure of his "Lord-fish," it does not

show an arched back or "a curiously grotesque appearance," the fish being apparently well formed. But, putting aside that specimen, I would remark upon my present example obtained from the same locality.

Length of head rather exceeding one third of the total length. Height of body nearly two thirds of the length of the head. Eyes large, diameter one fourth of the length of the head, $1\frac{1}{3}$ diameter from the end of the snout and one transverse diameter apart. The maxilla reaches to beneath the middle of the orbit; its length is a half of that of the head. Body in good condition. *Fins*: the origin of the first dorsal is midway between the end of the snout and the posterior end of the base of the last dorsal fin, it is rather elevated and pointed; the middle dorsal fin rather low; the third dorsal fin similar to the first. Second ventral ray rather prolonged. Pectoral reaches to above the vent, the latter being beneath the first ray of the second dorsal fin. *Lateral line* curved to below the middle of the second dorsal fin.

Having as yet this single example, I have been unwilling to sacrifice it in order to examine the spine, which I would not hesitate doing did I possess a second specimen. I would suggest the following reasons why this fish cannot be a deformed *Morrhua vulgaris* occasioned by spinal disease.

If the differences were entirely caused by disease of the spine posterior to the head, it is to be supposed that the head itself would remain unaffected; but here it is not so; and in comparing it with an example of the Common Cod of the same length, and captured at the same time, I find as follows:—

Morrhua vulgaris. Eye $\frac{1}{5}$ of head; upper jaw $\frac{2}{5}$ of length of head; vent midway between end of snout and base of caudal fin.

Morrhua macrocephala. Eye $\frac{1}{4}$ of head; upper jaw $\frac{1}{2}$ of length of head; vent midway between end of snout and beyond end of caudal fin.

The proportions as regards the eye and upper jaw do not appear to have been recorded in the examples from Scotland.

It will be seen that the vent is directly below the commencement of the second dorsal fin, exactly as in *Morrhua vulgaris*; consequently if this example is merely a deformed specimen, such would lead us to expect that the deformity would be posterior to the vent. But the first dorsal fin, which is anterior to it, has only 11 instead of 14 rays, and is much more angular than in the Common Cod.

This fish, I suppose, may be *Gadus punctatus*, Turton, of which

Fleming observed, "I would venture to suggest that it is only a variety of *Gadus morrhua*."

It agrees with *Gadus macrocephalus*, Tiles. ; but unfortunately that author does not record the number of fin-rays. However, the length of the head, size of the eye, extent of the upper jaw, and the elongated ventral ray are the same. Tilesius's example came from Kamtschatka ; Kner and Steindachner's from Decastris Bay. *Gadus callarias* (Bloch), Griffith in Cuv. Animal Kingdom, x. p. 484, may be this species, which he observes has the upper jaw longer than in *Gadus morrhua* ; but such is not shown in Bloch's figure, which appears to represent the Common Cod.

The "Lord-fish" of Yarrell appears to differ from this specimen in the eye being smaller and the upper jaw shorter ; but it must be remembered that only a coloured figure was kept. The number of rays in the fins of fishes of this genus are subject to considerable variation ; but if Turton's, Yarrell's, Kner and Steindachner's, and the present form are examples of the same species, the latitude must be very wide indeed.

PLATE XIV.

Morrhua macrocephala, reduced sketch of the specimen obtained at the mouth of the Thames, 1879.

MOLLUSCA OF H.M.S. 'CHALLENGER' EXPEDITION.

IV. TROCHIDÆ continued, viz. the Genera *Basilissa* and *Trochus*, and the TURBINIDÆ, viz. the Genus *Turbo*. By the Rev. R. BOOG WATSON, B.A., F.L.S., &c.

[Published by permission of the Lords Commissioners of the Treasury.]

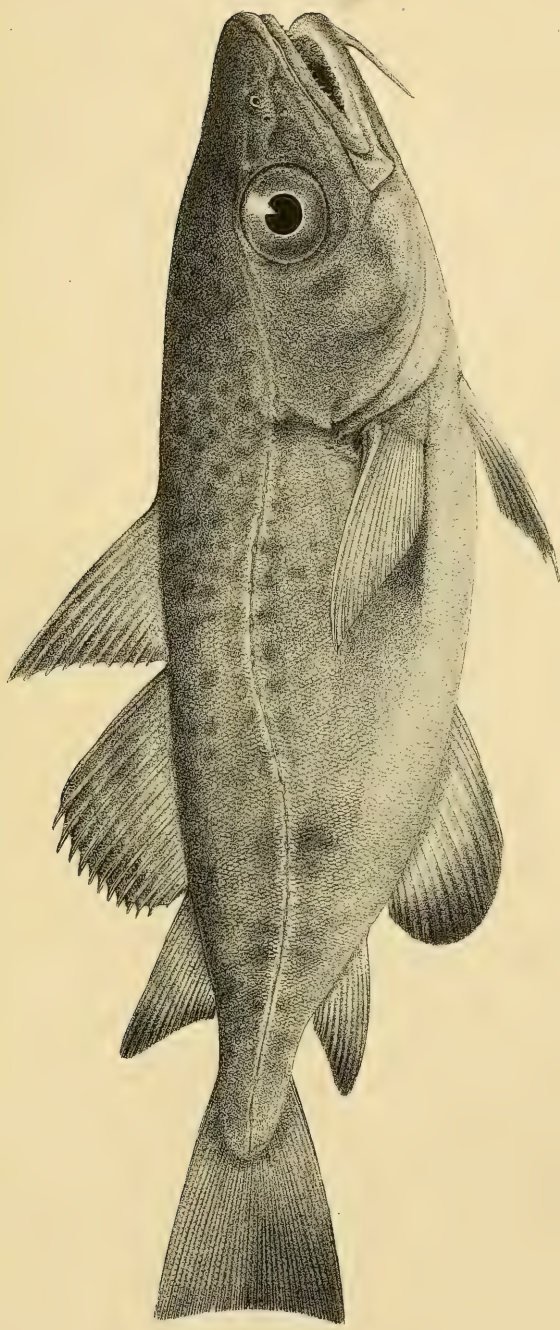
[Read June 5, 1879.]

THE *Basilissa oxytropis* which follows did not present itself in time to be included in the previous list.

Of the *Trochus* group the Margaritas are many of them remarkable for beauty and for form.

The Turbos are very few ; but one is of extraordinary beauty.

All the species now communicated are new. Some are from very deep water. All throw light on a marine zone not yet familiar. The list of known species presents no such features of interest as to call for its publication at present.



F. Day, del. C. Achilles, lith.

MORRHUA MACROCEPHALA.

Mintern Bros, imp.